is changed according to the vehicle condition, but teaches nothing about an abrupt torque change in the transient state between different driving patterns. Nor does it suggest avoiding the torque change by controlling the target value in the manner set forth in amended Claim 22 above.

Generally speaking, the method of controlling a vehicle according to the present invention is one in which the vehicle can be operated selectively in a first running mode or a second running mode. The first running mode represents a normal drive mode wherein, e.g., an engine torque is controlled in accordance with the depression amount of the accelerator pedal operated by a driver. The second mode represents an automatic drive mode such as a cruise control (a constant vehicle speed control) or a constant headway distance control. The first target value of the first running mode is determined on the basis of a depressed accelerator pedal stroke. The second target value of the second running mode is determined from an environmental operating condition or conditions of the running vehicle.

During a transient state of the vehicle when the first running or normal drive mode is changed to the second or automatic drive mode, the vehicle or engine is controlled according to the third target value (Ttar) whereby a heavy shock of the vehicle due to a sharp change of the target value can be avoided. The third target value is gradually varied from the first target value to the second target value during a transient period Ts as shown in Fig. 3.

In new independent Claim 30, the target and control parameter is defined as a driving force of the vehicle. In independent Claims 18 and 24, the target and control parameter is an acceleration/deceleration rate of the vehicle. In

independent Claims 20 and 26, the target and control parameter is a driving shaft torque of the vehicle. In Claims 22 and 28, the target and control parameter is a driving shaft torque and an engine torque. No such method is employed in the Ibamoto et al. patent or, for that matter, any of the other cited references.

Accordingly, the rejection of Claims 16 and 17 as being unpatentable over Saur et al. in view of Watanabe et al., the rejection of Claim 18 as being unpatentable over Saur et al. in view of Minowa et al., the rejection of Claim 19 as being unpatentable over Saur et al. in view of Minowa et al. and Omari et al., the rejection of Claim 20 as being unpatentable over Nakamura in view of Ibamoto et al., the rejection of Claims 21 and 23 as being unpatentable over Nakamura in view of Ibamoto et al. and Watanabe et al., and the rejection of apparatus Claims 24-29, all under 35 USC § 103(a), are traversed.

Reconsideration is requested on grounds that the Office Action does not set forth a *prima facie* case of obviousness based on substantial record evidence. Instead, it is based upon impermissible hindsight. Moreover, the Office Action does not relate the structure in the several prior art references to the structure set forth in Claims 24-29. We begin the analysis with the Saur et al. patent.

The Saur et al. patent discloses a cruise control device which uses the acceleration controller to accelerate the vehicle speed to a target speed when the vehicle speed is reduced due to the increase of running load. However, the Saur et al. patent is not concerned with abrupt torque change in the transient state between different running modes such as a normal running mode and a cruise

control mode, nor does it suggest avoiding the torque change by controlling the target value.

The Watanabe et al. patent discloses a method for controlling a vehicle having a Continuously Variable Transmission (CVT), but not first and second running modes. The target driving force is determined, and the engine output and/or the speed ratio of the CVT are controlled to make the actual driving force approaching the target driving force. There would have been no motivation to apply the CVT control of the Watanabe et al. patent to the cruise control device of the Saur et al. patent. The Watanabe et al. patent is also not concerned with an abrupt torque change in the transient state between different running modes, which are not present, nor does it suggest avoidance of the torque change by controlling the target value.

The Minowa et al. patent discloses a vehicle power train control system having only a single control mode wherein a target acceleration/deceleration rate and a target driving torque are calculated based on the vehicle speed, the amount of depression of the acceleration pedal and brake pedal, and the inclination of the road. The control operation values are determined according to the calculated target values, and the vehicle is controlled with those values. The Minowa et al. patent is also not concerned with an abrupt torque change in the transient state between different running modes. Nor does it suggest avoiding a torque change by controlling the target value. Even if the power train control system in the Minowa et al. patent were used with a cruise control device as taught in the Saur et al. patent, the hypothetical resulting from that combination would not set the third target value for the transient state between

different running modes and the third target value is gradually varied in the transient phase.

The Onari et al. patent teaches that the vehicle control method is changed according to vehicle condition and driver operation. The different control methods are provided as different control programs corresponding to an air/fuel ratio control, an acceleration control, deceleration control, and an idling control. The Onari et al. patent does not involve an abrupt torque change in the transient state between different control methods, nor does it suggest avoiding the torque change by controlling the target value at the transient phase.

The Nakamura et al. patent teaches only that the transmission ratio is controlled to match the actual vehicle speed approaching a target vehicle speed. Like the other patents, the Nakamura et al. patent is not concerned with an abrupt torque change in the transient state between different running modes, nor does it suggest avoiding the torque change by controlling the target value. In fact, none of the cited references teaches or suggests setting the third target value such that the vehicle or engine is controlled by the third target value which varies from the first target value to the second target value in the transient state (Ts) from the first running mode to the second running mode.

Accordingly, favorable action is earnestly solicited.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and

please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #381AS/44307C2).

Respectfully submitted,

August 28, 2002

James F. McKeown
Registration No. 25,406

CROWELL & MORING, LLP
P.O. Box 14300
Washington, DC 20044-4300
Telephone No.: (202) 624-2500
Facsimile No.: (202) 628-8844

JFM/acd
56203.218

VERSION WITH MARKINGS TO SHOW CHANGES

IN THE CLAIMS:

17. (Amended) A method of controlling a vehicle according to claim [16] 30, wherein the driving force of the vehicle is controlled to [be] gradually [approached to] approach said driving force of the second running mode by controlling an air/fuel ratio of an engine of said vehicle.

18. (Amended) A method of controlling a vehicle [, wherein when an acceleration/deceleration rate of the vehicle is changed from an acceleration/ deceleration rate of] having a first running mode wherein an acceleration/ deceleration rate of the vehicle is controlled according to a first target value determined from an accelerator pedal position [to an acceleration/deceleration rate of] and a second running mode wherein an acceleration/deceleration rate of the vehicle is controlled according to a second target value determined from [an] at least one environmental operating [conditions] condition ahead of said vehicle, [if a difference between the acceleration/deceleration rate of said first running mode and the acceleration/deceleration rate of said second running mode exceeds a predetermined value, the acceleration/deceleration rate of the vehicle is controlled to be gradually approached to said acceleration/deceleration rate of the second running mode] comprising:

when said first running mode is changed to said second running mode, determining a changing-over time period from said first running mode to said second running mode based on a difference between said first target value

calculated in said first running mode and said second target value calculated in said second running mode; and

setting a third target value which varies from said first target value to said second target value in said changing-over time period.

19. (Amended) A method of controlling a vehicle according to claim 18, wherein the acceleration/deceleration rate of the [vehicle] first running mode is controlled to [be] gradually [approached to] approach said acceleration/ deceleration rate of the second running mode by controlling an air/fuel ratio of an engine of said vehicle.

20. (Amended) A method of controlling a vehicle [, wherein when a driving shaft torque of the vehicle is changed from a driving shaft torque of] having a first running mode wherein a driving shaft torque of the vehicle is controlled according to a first target value determined from an accelerator pedal position [to a driving shaft torque of] and a second running mode wherein [a] the driving shaft torque of the vehicle is controlled according to a second target value determined from an environmental operating conditions ahead of said vehicle, [if a difference between the driving shaft torque of said first running mode and the driving shaft torque of said second running mode exceeds a predetermined value, the driving shaft torque of the vehicle is controlled to be gradually approached to said driving shaft torque of the second running mode] comprising:

when said first running mode is changed to said second running mode, determining a changing-over time period from said first running mode to said

second running mode based on a difference between said first target value calculated in said first running mode and said second target value calculated in said second running mode; and

setting a third target value which varies from said first target value to said second target value in said changing-over time period.

21. (Amended) A method of controlling a vehicle according to claim 20, wherein the driving shaft torque of the [vehicle] first running mode is controlled to [be] gradually [approached to] approach said driving shaft torque of the second running mode by controlling an air/fuel ratio of an engine of said vehicle.

22. (Amended) A method of controlling a vehicle [, wherein when a first target value of a driving shaft torque of] having a first running mode wherein an engine torque of the vehicle is controlled according to [the] a first target value determined from an accelerator pedal position [to a second target value of a driving shaft torque of] and a second running mode wherein the engine torque is controlled according to [the] a second target value determined from an environmental operating conditions ahead of said vehicle, [if a difference between the first and second target values exceeds a predetermined value, the target value is controlled to be gradually approached to said second target value] comprising:

when said first running mode is changed to said second running mode, determining a changing-over time period from said first running mode to said second running mode based on a difference between said first target value

calculated in said first running mode and said second target value calculated in said second running mode; and

setting a third target value which varies from said first target value to said second target value in said changing-over time period.

23. (Amended) A method of controlling a vehicle according to claim 22, wherein the target value is controlled to [be] gradually [approached to] approach said second target value by controlling an air/fuel ratio of the engine of said vehicle.

24. (Amended) A control apparatus for a vehicle [, wherein when a first target value of] having a first running mode wherein an acceleration/deceleration rate of the vehicle is controlled according to [the] a first target value determined from an accelerator pedal position [to a second target value of] and a second running mode wherein an acceleration/deceleration rate of the vehicle is controlled according to [the] a second target value determined from [an] environmental operating conditions ahead of said vehicle, [if a difference between the acceleration/deceleration rate of the first running mode and the acceleration/deceleration rate of the second running mode exceeds a predetermined value, the acceleration/deceleration rate is controlled to be gradually approached to the acceleration/deceleration rate of said second running mode] comprising:

when said first running mode is changed to said second running mode, determining a changing-over time period from said first running mode to said

second running mode based on a difference between said first target value calculated in said first running mode and said second target value calculated in said second running mode; and

setting a third target value which varies from said first target value to said second target value in said changing-over time period.

25. (Amended) A control apparatus for a vehicle according to claim 24, wherein the acceleration/deceleration rate is controlled to [be] gradually [approached to] approach the acceleration/deceleration rate of said second running mode by controlling an air/fuel ratio of an engine of said vehicle.

26. (Amended) A control apparatus for a vehicle [, wherein when a first target value of] having a first running mode wherein a driving shaft torque of the vehicle is controlled according to a driving shaft torque of the vehicle [is controlled according to the first target value determined rom] from an accelerator pedal position [to a second target value of] and a second running mode wherein [a] the driving shaft torque of the vehicle is controlled according to the second target value determined from [an] environmental operating conditions ahead of said vehicle, [if a difference between the driving shaft torque of the first running mode and the driving shaft torque of the second running mode exceeds a predetermined value, the driving shaft torque is controlled to be gradually approached to the driving shaft torque of said second running mode] comprising:

when said first running mode is changed to said second running mode, determining a changing-over time period from said first running mode to said second running mode based on a difference between said first target value calculated in said first running mode and said second target value calculated in said second running mode; and

setting a third target value which varies from said first target value to said second target value in said changing-over time period.

27. (Amended) A control apparatus for a vehicle according to claim 26, wherein the driving shaft torque is controlled to [be] gradually [approached to] approach the driving shaft torque of said second running mode by controlling an air/fuel ratio of an engine of said vehicle.

28. (Amended) A control apparatus for a vehicle [, wherein when a first target value of a driving shaft torque of] having a first running mode wherein an engine torque of the vehicle is controlled according to [the] a first target value determined from an accelerator pedal position [to a second target value of a driving shaft torque of] and a second running mode wherein the engine torque is controlled according to [the] a second target value determined from [an] at least one environmental operating condition ahead of said vehicle, [if a difference between the first and second target value exceeds a predetermined value, the target value is controlled to be gradually approached to said second target value] comprising:

when said first running mode is changed to said second running mode, determining a changing-over time period from said first running mode to said second running mode based on a difference between said first target value calculated in said first running mode and said second target value calculated in said second running mode; and

setting a third target value which varies from said first target value to said second target value in said changing-over time period.

29. (Amended) A control apparatus for a vehicle according to claim 28, wherein the target value is controlled to [be] gradually [approached to] approach said second target value by controlling an air/fuel ratio of an engine of said vehicle.